

AMENDMENTS TO THE CLAIMS

1. **(Currently Amended)** A chemically bonded biomaterial element comprising:
an inorganic cement, exhibiting minimal dimensional changes upon hardening and long-time use, improved mechanical properties and improved translucency;
and added inert filler particles, wherein
the biomaterial element has a micro-structure to meet an algorithm, which is defined by a formula:

$$\lambda = \frac{d * (1 - V_F)}{(V_F)}$$

where λ is the distance between filler particles of mean size d , and V_F is the volume content of non-reacted cement and the added inert filler particles, and where $\lambda \leq 10 \mu\text{m}$, and
wherein the added inert filler particles have a particle size below $5 \mu\text{m}$, and
wherein the added inert filler particles consist of glass particles, apatites, brucite and/or bohmite.

2. (Previously Presented) The biomaterial element according to claim 1, wherein $\lambda \leq 8 \mu\text{m}$.

3. (Previously Presented) The biomaterial element according to claim 1, wherein V_F is less than 50 %.

4. (Previously Presented) The biomaterial element according to claim 1, wherein it exerts a pressure or tensile force of $< 5 \text{ MPa}$ on a surrounding volume.

5. (Previously Presented) The biomaterial element according to claim 1, wherein

the inorganic cement comprises Ca-aluminate, Casilicate and or Ca-phosphate, or a mixture thereof.

6. (Previously Presented) A biomaterial element according to claim 1, wherein the inorganic cement comprises $\text{CaO-Al}_2\text{O}_3$ system, and a particle size of formed hydrates of these phases is below $3\text{ }\mu\text{m}$.

7. (Previously Presented) The biomaterial element according to claim 1, wherein the biomaterial element further comprises an organic phase of polyacrylates and/or polycarbonates at a volume content of less than 5 %.

8-9. (Cancelled)

10. (Previously Presented) The biomaterial element according to claim 1, wherein it comprises in-situ formed apatite that separates the formed hydrates of the main system.

11. (Previously Presented) The biomaterial element according to claim 1, wherein a total porosity is below 10 %, where at least 90% of the pores are minipores having a diameter below $0.5\text{ }\mu\text{m}$.

12. (Currently Amended) The biomaterial element according to claim 1, wherein it is a dental material[[,]].

13. (Previously Presented) The biomaterial element according to claim 1, wherein the biomaterial element contains an orthopaedic material or a bone cement.

14. (Previously Presented) The biomaterial element according to claim 1, wherein it is a component, or is in granule form, or in a carrier material for drug delivery.

15. (Cancelled)
16. (Previously Presented) The biomaterial element according to claim 1, wherein $\lambda \leq 4$ μm .
17. (Previously Presented) The biomaterial element according to claim 1, wherein $\lambda \leq 2$ μm .
18. (Previously Presented) The biomaterial element according to claim 1, wherein V_F is 5-45 %.
19. (Previously Presented) The biomaterial element according to claim 1, wherein V_F is 15-35 %.
20. (Previously Presented) The biomaterial element according to claim 1, wherein it exerts a pressure or tensile force of < 2 MPa on a surrounding volume.
21. (Previously Presented) The biomaterial element according to claim 1, wherein it exerts a pressure or tensile force of < 1 MPa on a surrounding volume.
22. (Previously Presented) The biomaterial element according to claim 6, wherein the CaO-Al₂O₃ system is CaO, (CaO)₃Al₂O₃, (CaO)₁₂(Al₂O₃)₇, CaOAl₂O₃, (CaO)(Al₂O₃)₂, (CaO)(Al₂O₃)₆ or pure Al₂O₃ or a mixture thereof.
23. (Previously Presented) The biomaterial element according to claim 6, wherein a main phase of the CaO-Al₂O₃ system is CaOAl₂O₃ or (CaO)(Al₂O₃)₂.

24. (Previously Presented) The biomaterial element according to claim 6, wherein a main phase of the $\text{CaO-Al}_2\text{O}_3$ system is CaOAl_2O_3 .

25. (Previously Presented) The biomaterial element according to claim 6, wherein a particle size of formed hydrates of these phases is below 1 μm .

26. (Previously Presented) The biomaterial element according to claim 6, wherein a particle size of formed hydrates of these phases is below 0.5 μm .

27. (Previously Presented) The biomaterial element according to claim 1, wherein added inert filler particles have a particle size below 2 μm .

28. (Previously Presented) The biomaterial element according to claim 1, wherein a total porosity is below 5 %, distributed on minipores having a diameter below 0.1 μm , to an extent of at least 90 % of the total porosity.

29. (Previously Presented) A biomaterial element according to claim 12, wherein the dental material is a dental filling material or a root filling material.